UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,498	10/23/2003	Karlheinz Winter	32128-187212	6037

26694 7590 06/11/2009

VENABLE LLP
P.O. BOX 34385
WASHINGTON, DC 20043-9998

EXAMINER	
WOLLSCHLAGER, JEFFREY MICHAEL	
ART UNIT	PAPER NUMBER
1791	
MAIL DATE	DELIVERY MODE
06/11/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/690,498	WINTER ET AL.	
	Examiner	Art Unit	
	JEFFREY WOLLSCHLAGER	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 March 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *4-6,8-12,15,16 and 30-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *4-6,8-12, 15,16 and 30-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's amendment filed March 12, 2009 has been entered. Claims 4-6, 8-12, 15, 16 and 30-32 are pending and under examination. Claims 1-3, 7, 13, 14 and 17-29 have been canceled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 4, 5, 8-12, 16 and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ootsuji et al. (US 3,868,436) in view of Fuwa et al. (US 3,928,525), Gould (US 3,331,100), Schmid et al. (US 5,804,116), and Henkel et al. (DE2303830, published October 26, 1973).

Regarding claims 8, 30 and 32, Ootsuji et al. teach a method of extruding a peroxide crosslinked polymeric material over a conductor wherein a crosslinkable polymer, such as

polyethylene, a peroxide/crosslinking agent and a stabilizing agent are fed to an extruder (col. 11, lines 36-col. 12, lines 4). The mixture is plasticated/melted in the extruder, but is not crosslinked (Abstract; col. 3, lines 46-56) (i.e. the polymer is heated above the melting point, but is maintained below the crosslinking temperature). Subsequent to exiting the extruder, the mixture enters a long die land (Figure 1; (4)) wherein the mixture is crosslinked to the desired extent (col. 4, lines 2-5; col. 5, lines 10-17; col. 9, lines 22-32). Ootsuji et al. teach that the temperature is optimized within the die land (col. 9, lines 43-67) and exemplify a temperature of 250 °C in the die land (Example 1). The examiner notes that the cited peroxides in Ootsuji et al. decompose at temperatures of 171 °C – 186 °C (col. 9, lines 56-62) and that the decomposition of the peroxide is what initiates the crosslinking of the polyethylene (i.e. the temperature in the die land is approximately 30-45% above the crosslinking temperature). Further, the examiner notes that the melting point of polyethylene is approximately in the range of 125 °C - 140 °C. Upon completing the extrusion process, Ootsuji et al. teach that the crosslinking may be as high as 98% (col. 10, lines 48-52).

Regarding the extrusion pressure, Ootsuji et al. teach and suggest that the pressure of the extrusion can be optimized and lessened by utilizing a lubricant in the die land portion (col. 10, lines 1-15; col. 10, lines 32-58). The examiner notes that a reduction of pressure in the die land and the connected downstream equipment yields a corresponding reduction in the upstream extrusion pressure. Further, Ootsuji et al. suggest optimizing the extrusion temperature (col. 3, lines 46-56col. 9, lines 66-68) to ensure the material is plasticated/melted in the extruder while also ensuring the material does not reach the crosslinking temperature. Since temperature and pressure in the extruder are inextricably linked, a change in temperature also yields a corresponding (i.e. related/connected) change in pressure. Further still, Ootsuji et

al. teach that in the instant process a screw extruder is usually employed, but that a ram extrusion process is also suitable (col. 9, lines 9-20).

Ootsuji et al. do not teach forming a tubular article (i.e. the extruded material without a conductor) or that the extruder is heated externally and cooled internally. However, Fuwa et al. teach a highly analogous method of extruding crosslinkable polymeric materials wherein a coated conductor or a tubular article is produced to form a desired product and suggest that similar extrusion methods are suitable for producing both a coated conductor or a tubular article with a long land die wherein temperatures are chosen to form the article below the crosslinking temperature in the extruder and to then crosslink the material in the long land die portion (col. 1, lines 9-25; col. 8, lines 32-44; col. 10, lines 26-42; Example 1; claims 1, 10, 12 and 13). Additionally, Schmid et al. teach a method of extruding tubular materials (col. 1, lines 58-66; col. 2, lines 45-56; Abstract; Figure 1) over a mandrel where the extruder temperature is cooled with a hollow screw (Figure 1 and 2; col. 10, line 17- col. 11, line 32) and Gould teaches that it is known in the art to electrically heat the barrel of the extruder while internally heating/cooling the screw in order to obtain a uniform temperature of the plastic melt and to achieve rapid heat plastification (col. 1, lines 9-33).

Further, while Ootsuji et al. suggest optimizing the extrusion pressure to the ordinarily skilled artisan, Ootsuji et al. do not expressly recite a pressure within the claimed range. However, Henkel et al. a screw extrusion method of forming a crosslinkable polymer wherein the crosslinking is performed at a pressure of greater than 1000 kg/cm^2 (980.6 bars) to yield an improved product (Abstract).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Ootsuji et al. and to have employed an extruder having internal cooling means, as suggested by Schmid and Gould, for

the purpose, as suggested by Gould, of obtaining a uniform temperature of the melt in the extruder and to achieve rapid heat plastification. Further, it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Ootsuji et al., and to have formed a tubular article, as suggested by Fuwa et al., since Fuwa et al. suggest that such extrusion methods employing long land dies are known in the art to be suitable for forming both coated conductors and tubular articles. Further still, it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have employed a crosslinking pressure as suggested by DE2303830 in the method of Ootsuji et al. for the purpose of realizing an improved product.

As to claim 4, Schmid et al. disclose double screw extruders (col. 2, lines 45-68; col. 8, lines 57-58) as being suitable for processing large amounts of material. It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to have employed a double screw extruder while practicing the method of Ootsuji et al., as suggested by Schmid et al., for the purpose of producing desired amounts of products while achieving the desired degree of mixing.

As to claim 5, Ootsuji et al. teach heating the die land electrically (col. 9, lines 42-54) and Fuwa et al. disclose the die land is heated with a band heater (Figure 1; (6)).

As to claims 9 and 10, Ootsuji et al. teach plasticating/melting the material in the extruder, but not to a temperature that causes crosslinking. Further, Ootsuji et al. exemplify processing polyethylene, the same material disclosed in the instant application (paragraph [0036], US 2004/0086592). As such, it follows that the polymer employed by Ootsuji et al. has a crosslinking temperature approximately 30% above the melting point of the polymer and that the temperature of the polymer prior to entry into the die land would be less than 30% above the melting point to ensure crosslinking did not occur in the extruder as explicitly taught by Ootsuji

et al. Ootsuji et al. employ the same disclosed material, polyethylene. As such, the material has the same claimed physical properties.

As to claims 11 and 12, Ootsuji et al. employ polyethylene (col. 1, lines 36-38; Example 1). This is the same material employed in the instant application (paragraph [0036], US 2004/0086592). As such, the material has the same melting point and crosslinking temperature. Further, Ootsuji et al. employ peroxides that decompose at temperatures of 171 °C – 186 °C (col. 9, lines 56-62). The examiner notes that it is the decomposition of the peroxide that initiates the crosslinking of the polyethylene.

As to claim 16, Ootsuji et al. teach cooling the crosslinked material (Figure 1 (7); col. 4, lines 6-20).

As to claim 31, Ootsuji et al. employ organic peroxides (col. 9, lines 56-63).

Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ootsuji et al. (US 3,868,436) in view of Fuwa et al. (US 3,928,525), and Gould (US 3,331,100) and Schmid et al. (US 5,804,116), and Henkel et al. (DE2303830, published October 26, 1973), as applied to claims 4, 5, 8-12, 16 and 30-32 above, and further in view of Munsell (US 3,095,608).

As to claims 6 and 15, the combination teaches the method set forth above. Ootsuji et al. do not teach inductively heating from the interior of the die or maintaining the temperature at a temperature above the crosslinking temperature after discharge from the extrusion die.

However, Munsell teaches and suggests inducting heat from the interior of the die (Figure (42); col. 2, lines 1-20) and maintaining the temperature above the crosslinking temperature for a period after leaving the die to ensure adequate crosslinking prior to being cooled (col. 4, lines 1-9; col. 5, lines 8-13).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Ootsuji et al. and to have inductively heated from the interior of the die and to have maintained the temperature at a temperature above the crosslinking temperature after discharge from the extrusion die as suggested by Munsell since Munsell suggests that such methods are an equivalent alternative means of achieving suitable crosslinking of extruded articles.

Claims 4, 5, 8-12, 16 and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fulconis (US 4,126,661) in view of Ootsuji et al. (US 3,868,436), Gould (US 3,331,100) and Schmid et al. (US 5,804,116).

Regarding claims 5, 8-12, 16, and 30-32 Fulconis et al. teach the basic claimed process of continuosly producing a crosslinked polymer tube (Abstract; col. 2, lines 7-10) comprising providing polyethylene and a peroxide crosslinking agent (col. 1, lines 5-38) to an extruder; heating the mixture in the extruder (element (8)), but maintaining the temperature below the crosslinking temperature (col. 4, lines 50-62); continuously feeding the mixture from the extruder to an extrusion die at a pressure between 500 and 1500 bars (col. 5, lines 8-13); and heating the mixture in the extrusion die to effect crosslinking of the material at a temperature between 200 and 300 °C (col. 5, lines 1-6; Figure (4) – first die; (13) – second die; col. 6, lines 1-5) to achieve greater than 60% gelling (Table). Fulconis et al. do not expressly recite utilizing stabilizers or internal cooling capacity as claimed.

However Ootsuji et al. teach an analogous method of forming a crosslinked extrudate wherein stabilizers are employed (col. 11, line 65-col. 12, line 3). Additionally, Schmid et al. teach a method of extruding tubular materials (col. 1, lines 58-66; col. 2, lines 45-56; Abstract; Figure 1) over a mandrel where the extruder temperature is cooled with a hollow screw (Figure

1 and 2; col. 10, line 17- col. 11, line 32) and Gould teaches that it is known in the art to electrically heat the barrel of the extruder while internally heating/cooling the screw in order to obtain a uniform temperature of the plastic melt and to achieve rapid heat plastification (col. 1, lines 9-33).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Fulconis et al. and to have employed a stabilizer, as suggested by Ootsuji et al,. for the purpose of providing conventional properties to the product and to minimize degradation (e.g. oxidation). Further, it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Fulconis et al. and to have employed cooling and heating capacity in elements (35) and (36) for the purpose of effectively controlling the temperature of the polymer and to avoid unintended and uncontrolled heating.

As to claim 4, Schmid et al. disclose double screw extruders (col. 2, lines 45-68; col. 8, lines 57-58) as being suitable for processing large amounts of material and Ootsuji et al. suggest screw extruders and ram extruders can be employed as equivalent alternatives in the analogous art (col. 9, lines 7-20). It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to have employed a double screw extruder while practicing the method of Fulconis et al.., as suggested by Schmid et al. and Ootsuji et al, for the purpose of producing desired amounts of products while achieving the desired degree of mixing.

Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fulconis (US 4,126,661) in view of Ootsuji et al. (US 3,868,436), Gould (US 3,331,100) and Schmid et al. (US 5,804,116), as applied to claims 4, 5, 8-12, 16 and 30-32 above, and further in view of Munsell (US 3,095,608).

As to claims 6 and 15, the combination teaches the method set forth above. Fulconis et al. do not teach inductively heating from the interior of the die or maintaining the temperature at a temperature above the crosslinking temperature after discharge from the extrusion die.

However, Munsell teaches and suggests inducting heat from the interior of the die (Figure (42); col. 2, lines 1-20) and maintaining the temperature above the crosslinking temperature for a period after leaving the die to ensure adequate crosslinking prior to being cooled (col. 4, lines 1-9; col. 5, lines 8-13).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Fulconis et al. and to have inductively heated from the interior of the die and to have maintained the temperature at a temperature above the crosslinking temperature after discharge from the extrusion die as suggested by Munsell since Munsell suggests that such methods are an equivalent alternative means of achieving suitable crosslinking of extruded articles.

.

Response to Arguments

Applicant's arguments filed March 12, 2009 have been fully considered and they are persuasive. Accordingly, the previous rejection has been withdrawn. However, upon further consideration new grounds of rejection are made as set forth above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFFREY WOLLSCHLAGER whose telephone number is (571)272-8937. The examiner can normally be reached on Monday - Thursday 6:45 - 4:15, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeff Wollschlager/
Examiner, Art Unit 1791

June 11, 2009